Report No. 77-1-8

December, 1976
5230

EVALUATION OF SOUTHERN PINE BEETLE INFESTATIONS ON THE BLUE RIDGE PARKWAY, NORTH CAROLINA

By

I. R. RAGENOVICH

INTRODUCTION

Aerial sketchmap and ground surveys were conducted on the Blue Ridge Parkway in North Carolina from the Great Smoky Mountains National Park to the Julian Price Memorial Park. The Blue Ridge Parkway is administered by the U.S. Department of the Interior, National Park Service. The survey covered approximately 170 miles. The Forest Insect and Disease Management Group conducted the survey to determine the status and trend of the southern pine beetle populations on the Parkway.

Infestations were first detected on the Parkway in 1974 and are part of an outbreak occurring throughout the southern Appalachian Mountains. Southern pine beetle infestations are found in all 13 southern states.

METHODS

A one hundred percent aerial sketchmap survey was conducted along 170 miles of the Blue Ridge Parkway. A portion of the spots detected were examined on the ground to confirm the cause of mortality and determine the level of activity in the infested areas.

TECHNICAL INFORMATION

Insect - Southern pine beetle, Dendroctonus frontalis Zimm.

Hosts - Southern pine beetle is a native forest pest that will attack all species of southern yellow pine and occasionally other conifers as well. Susceptible southern yellow pines include Virginia (Pinus virginiana Mill.), shortleaf (P. echinata Mill.), and pitch (P. rigida Mill.).

Type of Damage - Death of the tree is the result of mining in the cambium by the southern pine beetle as it constructs egg galleries. The beetle also introduces blue stain fungi, Ceratocystis spp., which slow down or block conduction of water in the stem. The size of an infestation may range from a single tree to several thousand trees.

Life Cycle of the Beetle - Southern pine beetles attack in pairs and construct a winding gallery in the cambium. Eggs are deposited in niches along the sides of the galleries. The eggs hatch into whitish grubs that further mine the cambium and then construct cells in the bark where they pupate and change into adults. The new adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer, and as many as four or five generations may be produced annually in the area.

RESULTS AND DISCUSSION

Approximately 30 miles of the Parkway, near Asheville, N.C. between Mt. Pisgah and Craggy Gardens, is considered the infested area (Figure 1) and all spots detected were located within this area.

A summary of the aerial survey data is given below:

	Spot Size				
Singles	2-5 Spots:Trees	6-20 Spots:Trees	21-50 Spots:Trees	50+ Spots:Trees	Total Spots:Trees
1	4:20	7:90	--	5:535	16:646

Data analysis was done for only the infested area which contains an estimated 150 acres of susceptible host type. The aerial and ground check data is summarized in Table 1.

A total of 16 spots ranging from 1 to 200 trees in size were detected. Average spot size was 40 trees. This compares with 15 spots averaging 322 trees per spot in 1974. There are an estimated 194 infested trees within the area of infestation. Ground examination showed that most spots occurred in overstocked stands of Virginia and pitch pine. Twenty-five percent of the spots checked were actively infested.

Southern pine beetle populations have declined throughout many areas of the southern Appalachians and this decline is reflected on the Blue Ridge Parkway, also.

All known southern pine beetle spots should be located and checked for activity. Suppression measures should be conducted in the active spots by removing or chemically treating the actively infested trees. Ideally, suppression should be conducted during the winter when insect populations and activity are low.

The three suppression methods recommended by the U.S. Forest Service are:

1. Removal of infested and buffer strip trees.

2. Cut and chemically treat with a 1/2 percent lindane solution in No. 2 fuel oil or water.

3. Pile and burn.

Another evaluation will be conducted by Forest Insect and Disease Management in 1977.

RECOMMENDATIONS

It is recommended that:

1. All currently infested spots and trees be located.

2. Active spots should be controlled this winter by removal or chemical treatment of infested trees.

3. Active spots be rechecked this spring.

Note: Lindane is currently on the restricted list for the National Park Service and special permission would need to be obtained for its use. If chemicals are used, caution should be taken to follow the directions on the label.

REFERENCES

Ward, J.D., R.F. Bassett, and H.L. Lambert. 1974. Evaluation of Southern pine beetle infestations on the Blue Ridge Parkway, North Carolina. USDA, For. Serv., SA, S&PF Forest Insect and Disease Management Group, Rept. No. 75-1-5.

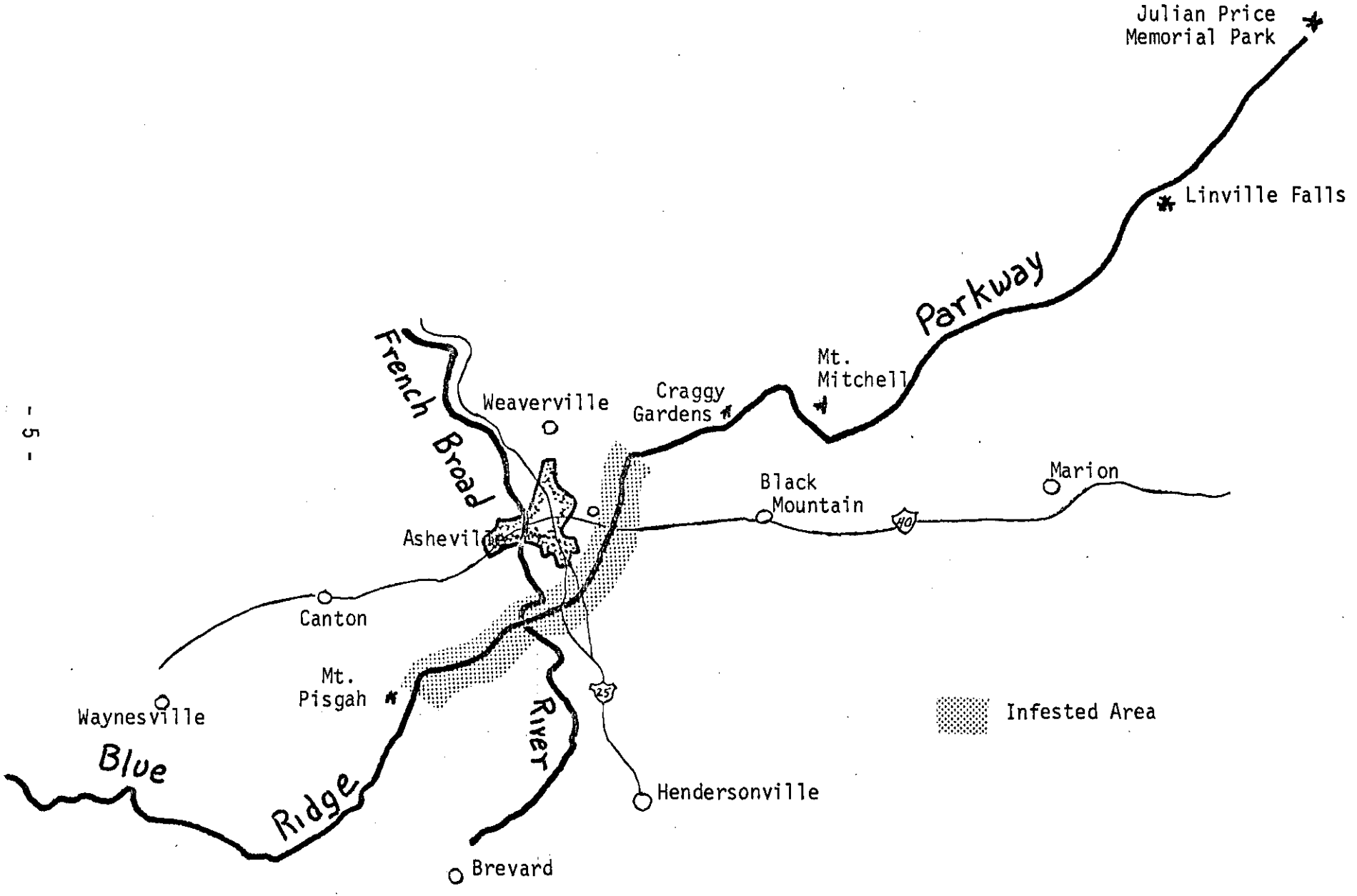

Figure 1: Map showing location of infested area on the Blue Ridge Parkway in North Carolina, 1976.

Table 1: Summary of aerial and ground check data for the Blue Ridge Parkway in North Carolina, 1976.

	Ownership Unit
	Blue Ridge Parkway
1. Results compiled from data collected during the aerial phase of the evaluation:	
Survey type	Sketchmap
Date of aerial survey	9/1/76
Percent survey	100
Total acreage surveyed	6300
Susceptible host type acreage of National Park Service land	150
Total number of spots on National Park Service lands	16
Spots per 100 acres of host type National Park Service lands	11
Average spot size (trees) National Park Service lands	40
Range of spot sizes (trees) National Park Service lands	1-200
Reds and faders/100 acres host type on National Park Service lands	431
2. Results compiled from data collected during the ground and aerial phases of the evaluation:	
Date of ground phase	10/5/76
Infested trees per 100 acre of host type National Park Service lands	129
Total number of infested trees on National Park Service lands	194
Total volume of infested trees on National Park Service lands	9.2 MBF
Total number of affected trees on National Park Service lands	1079
Total volume of affected trees on National Park Service lands	64.7 MBF
Ratio of green infested to total red and fading trees	1:6

Volume - BF - based on Scribner decimal C log rule. Cords converted to bd. ft. based on 500 bd. ft. per cord.